CLAIMS

What is claimed is:

1. A wireless communications system for aligning Code Division Multiple Access (CDMA) reverse link signals, the system comprising:

a first base station having (i) a first receiver to receive a signal having a unique orthogonal code from a given subscriber unit over a first reverse link and (ii) a first timing controller coupled to the receiver capable of determining a gross timing offset of the signal to make the signal essentially mutually orthogonal with signals from at least one other subscriber unit on the first reverse link;

a second base station having (i) a second receiver to receive simultaneously the signal having the unique orthogonal code from the given subscriber unit over a second reverse link and (ii) a second timing controller coupled to the second receiver capable of determining a gross timing offset of the signal to make the signal essentially mutually orthogonal with signals from at least one other subscriber unit on the second reverse link; and

an alignment controller in communication with the first and second timing controllers (i) to cause the signal to be orthogonally aligned with the signals from said at least one other subscriber unit on either the first reverse link or the second reverse link and (ii) to allow the signal to be orthogonally offset from the signals from said at least one other subscriber unit on the other reverse link.

2. The apparatus according to Claim 1 wherein, in response to being assigned responsibility for orthogonal alignment, the first or second timing controller reports the timing offset to the given subscriber unit in the form of a timing command or timing message.

3. The system according to Claim 1 wherein (i) the first base station includes a first power controller to determine a first power level of the coded signal at the first base station and (ii) the second base station includes a second power controller to determine a second power level of the coded signal at the second base station, wherein each power controller provides feedback of the power level to the given subscriber unit in the form of a power command or a power message.

4. The system according to Claim 3, wherein the power level feedback from the first and second power controllers causes the given subscriber unit to increase its power level based on the lesser of the two feedback signals and decrease its power level based on the lesser of the two feedback signals.

5. The system according to Claim 1 wherein the first base station includes the alignment controller and initiates timing control handoff.

6. The system according to Claim 1 wherein the second base station includes the alignment controller and initiates timing control handoff.

7. The system according to Claim 1 wherein the subscriber unit includes the alignment controller and initiates timing control handoff.

8. The system according to Claim 1 wherein a base station controller coupled to the first and second base stations includes the alignment controller and initiates timing control handoff.

9. The system according to Claim 1 wherein the alignment controller initiates timing control handoff, wherein the timing control handoff is based on at least one of the following criteria: (a) a metric of the transmission path between the subscriber unit and the base station not controlling the timing exceeds a

threshold for a predetermined timespan, (b) a metric of the transmission path between the subscriber unit and the base station not controlling the timing exceeds a threshold relative to a metric of a transmission path between the base station controlling the timing and the subscriber unit for a predetermined timespan, (c) a metric of the transmission path between the base station controlling the timing and the subscriber unit drops below an absolute metric, and (d) a metric of the transmission path between the base station not controlling the timing and the subscriber unit exceeds an absolute metric.

10. The system according to Claim 9 wherein the metric includes at least one of the following: (a) power, (b) signal-to-noise ratio (SNR), (c) variance of the power, (d) variance of the SNR, (e) between the orthogonally aligned path an non-orthogonally aligned paths between the given subscriber unit and the first and second base stations, relative ratio of the (i) power, (ii) SNR, (iii) variance of the power, or (iv) variance of the SNR, (f) bit error rate, and (g) energy per chip divided by the interference density (Ec/Io).

11. In a wireless communications system, a method for aligning Code Division Multiple Access (CDMA) reverse link signals, the method comprising:

by a first base station, (i) receiving a signal having a unique orthogonal code from a given subscriber unit over a first reverse link and (ii) determining a gross timing offset of the signal to make the signal essentially mutually orthogonal with signals from at least one other subscriber unit on the first reverse link;

by a second base station, (i) simultaneously receiving the signal having the unique orthogonal code from the given subscriber unit over a second reverse link and (ii) determining a gross timing offset of the signal to make the signal essentially mutually orthogonal with signals from at least one other subscriber unit on the second reverse link; and

(i) causing the signal to be orthogonally aligned with the signals from said at least one other subscriber unit on either the first reverse link or the second reverse link and (ii) allowing the signal to be orthogonally offset from the signals from said at least one other subscriber unit on the other reverse link.

12. The method according to Claim 11 wherein, in response to being assigned responsibility for orthogonal alignment, the first or second timing controller reports the timing offset to the given subscriber unit in the form of a timing command or timing message.

13. The method according to Claim 11 wherein (i) the first base station includes a first power controller to determine a first power level of the coded signal at the first base station and (ii) the second base station includes a second power controller to determine a second power level of the coded signal at the second base station, wherein each power controller provides feedback of the power level to the given subscriber unit in the form of a power command or a power message.

14. The method according to Claim 13, wherein the power level feedback from the first and second power controllers causes the given subscriber unit to increase its power level based on the lesser of the two feedback signals and decrease its power level based on the lesser of the two feedback signals.

15. The method according to Claim 11 wherein the first base station includes the alignment controller and initiates timing control handoff.

16. The method according to Claim 11 wherein the second base station includes the alignment controller and initiates timing control handoff.

17. The method according to Claim 11 wherein the subscriber unit includes the alignment controller and initiates timing control handoff.

18. The method according to Claim 11 wherein a base station controller coupled to the first and second base stations includes the alignment controller and initiates timing control handoff.

19. The method according to Claim 11 wherein the alignment controller initiates timing control handoff, wherein the timing control handoff is based on at least one of the following criteria: (a) a metric of the transmission path between the subscriber unit and the base station not controlling the timing exceeds a threshold for a predetermined timespan, (b) a metric of the transmission path between the subscriber unit and the base station not controlling the timing exceeds a threshold relative to a metric of a transmission path between the base station controlling the timing and the subscriber unit for a predetermined timespan, (c) a metric of the transmission path between the base station controlling the timing and the subscriber unit drops below an absolute metric, and (d) a metric of the transmission path between the base station not controlling the timing and the subscriber unit exceeds an absolute metric.

20. The method according to Claim 19 wherein the metric includes at least one of the following: (a) power, (b) signal-to-noise ratio (SNR), (c) variance of the power, (d) variance of the SNR, (e) between the orthogonally aligned path an non-orthogonally aligned paths between the given subscriber unit and the first and second base stations, relative ratio of the (i) power, (ii) SNR, (iii) variance of the power, or (iv) variance of the SNR, (f) bit error rate, and (g) energy per chip divided by the interference density (Ec/Io).

21. In a wireless communications system, an apparatus for aligning Code Division Multiple Access (CDMA) reverse link signals, the apparatus comprising:

at a first base station, (i) means for receiving a signal having a unique orthogonal code from a given subscriber unit over a first reverse link and (ii) means for determining a gross timing offset of the signal to make the signal essentially mutually orthogonal with signals from at least one other subscriber unit on the first reverse link;

at a second base station, (i) means for simultaneously receiving the signal having the unique orthogonal code from the given subscriber unit over a second reverse link and (ii) means for determining a gross timing offset of the signal to make the signal essentially mutually orthogonal with signals from at least one other subscriber unit on the second reverse link; and

(i) means for causing the signal to be orthogonally aligned with the signals from said at least one other subscriber unit on either the first reverse link or the second reverse link and (ii) means for allowing the signal to be orthogonally offset from the signals from said at least one other subscriber unit on the other reverse link.

22. A base station for aligning CDMA reverse link channels, the base station comprising:

an orthogonal channel receiver to receive an orthogonally coded signal from a subscriber unit over a reverse link; and

a timing controller to cause coarse timing adjustments to the timing of the coded signal in response to a command or message to reassign timing control of the subscriber unit previously under timing control by another base station.

23. In a base station, a method for aligning CDMA reverse link channels, the method comprising:

receiving an orthogonally coded reverse link signal from a subscriber unit over a reverse link;

in response to a command or message to reassign timing control of the reverse link of a subscriber unit previously under timing control by another base station, determining a gross timing offset of the coded signal and causing a coarse timing adjustment to the timing of the reverse link coded signal.

24. A base station for aligning a CDMA reverse link channel, the base station comprising:

means for receiving a unique, orthogonally coded reverse link signal from a subscriber unit over a reverse link; and

means for determining a gross timing offset of the coded signal and for causing coarse timing adjustments to the timing of the coded signal in response to a message to reassign timing control of the subscriber unit previously under timing control by another base station.

25. A subscriber unit operating in a wireless network aligning a CDMA reverse link channels, the subscriber unit comprising:

an orthogonal channel transmitter to transmit a unique, orthogonally coded signal over a reverse link to a base station; and

a timing adjustment unit to cause a coarse timing adjustment of the coded signal in response to receiving a gross timing offset from the base station to make the coded signal essentially mutually orthogonal with coded signals from at least one other subscriber unit on the reverse link with the base station.

26. In a subscriber unit operating in a wireless network, a method comprising:

transmitting a unique, orthogonally coded signal over a reverse link to a base station; and

making a coarse timing adjustment of the coded signal in response to receiving a gross timing offset from the base station to make the coded signal essentially mutually orthogonal with coded signals from at least one other subscriber unit on the reverse link with the base station.

27. A subscriber unit operating in a wireless network, comprising:

means for transmitting a unique, orthogonally coded signal over a reverse link to a base station; and

means for making a coarse timing adjustment of the coded signal in response to receiving a gross timing offset from the base station to make the coded signal essentially mutually orthogonal with coded signals from at least one other subscriber unit on the reverse link with the base station.

28. In a system that supports Code Division Multiple Access (CDMA) communications among members of a first group of terminals and among members of a second group of terminals, a method comprising:

assigning to the first group of terminals a first code, each user of the first group being uniquely identifiable by a unique code phase offset;

assigning to the second group of terminals the same code as used by the first group but each user of the second group using a common phase offset of that code;

assigning to each user of the second group an additional code, the additional code being unique for each of the terminals of the second group; and

for a given member of the second group, determining a gross timing offset to align the given member with the other members of the second group.

29. A wireless communications system comprising a first set of access units and a second set of access units, the first set of access units and the second set of access units capable of communicating with a central base station, the first set of

access units using a chip rate scrambling code to separate their user channels, each individual unit of the first set of access units having at least one unique, non-orthogonal scrambling sequence that is selected from a unique time shift of a longer pseudo random noise sequence, and the second group of access units (i) sharing a common chip rate scrambling code that is not used by the first group of access units and (ii) capable of making gross adjustments to the timing of the common chip rate scrambling code.